

Remarks

The Applicants have amended Claims 12 and 22 to correct typographical errors. Entry of the changes into the official file is respectfully requested.

Claims 12-13, 17, 19, 21-23, 27-29, 31 and 33-35 stand rejected under 35 USC §103 over the combination of Nishi JP with Nishi US. The Applicants respectfully submit that even if one skilled in the art were to hypothetically combine Nishi JP with Nishi US, the structure resulting from that combination would still be different from the subject matter of those claims. Details follow.

The rejection frankly acknowledges that Nishi US does not disclose the use of carboxylic anhydride groups. The Applicants agree. Thus, the rejection turns to Nishi JP to cure that deficiency. However, the Applicants respectfully submit that Nishi US fails to disclose additional important claimed subject matter. Although the Applicants will provide detailed explanations as to those differences between the subject matter of Claims 12-13, 17, 19, 21-23, 27-29, 31 and 33-35 over Nishi US, the Applicants begin with a summarized version of those differences.

In particular, both of Claims 12 and 22 recite that the semi-aromatic polyamide (B) contains mainly PA9. That can be PA9T and/or PA9N. This language is found specifically in Claim 12 at lines 9 and 10 and in Claim 22 in lines 4 and 5. Hence, the semi-aromatic polyamide is mainly made of PA9. This is sharply contrasted to Nishi US which discloses mainly PA12 as its polyamide (B). This is disclosed throughout Nishi US such as in the text generally spanning cols. 5 and 6 and at lines 38-39 in particular wherein PA12 is the "main" component. Thus, the Applicants' claims recite mainly PA9 as component (B) while Nishi US discloses mainly PA12 as component (B). These are completely different components and, irrespective of the addition of the subject matter of Nishi JP, that combination would still result in a structure which contains mainly PA12, as opposed to mainly containing PA9 as recited in the Applicants' claims. The Applicants therefore respectfully submit that the combination of Nishi JP with Nishi US is inapplicable.

A more detailed analysis follows.

The rejection on page 2 of the Official Action regarding Claims 12-13 states that Nishi US teaches a 3 layer tube with the inner most layer being a fluorine containing polymer with functional group which has reactively with polyamide based resins, including terephthalic acid and 1,9-nonanediamine (Claims 1 and 2 and col. 5, lines 55, to col. 6, line 65) and teaches an additional outer layer for the tube (Claim 5) and gives an example of the polyamide for the outer layer (Example 2).

The rejection also notes on page 6 of the Official Action that Nishi US teaches embodiments wherein the terephthalic acid and 1,9 nonane-diamine units are present in 100% by mass of all diamine and dicarboxylic units (col. 55, line 55, to col. 7, line 17).

However, the Applicants' Claim 12 reads as follows:

A multilayer tube comprising at least three layers including:

a layer (a) comprising (A) polyamide 11 and/or polyamide 12,

a layer (b) consisting of (B) a semi-aromatic polyamide or a combination of a semi-aromatic polyamide and an additive selected from the group consisting of an antioxidant, a heat stabilizer, an ultraviolet absorbent, a light stabilizer, a lubricant, an inorganic filler, an antistatic agent, a flame retardant, a crystallization accelerator, a plasticizer, a colorant, a lubricating agent and an impact resistance improver, said semi-aromatic polyamide (B) comprising a dicarboxylic acid unit containing a terephthalic acid and/or naphthalenedicarboxylic acid unit in a proportion of about 50 mol% or more based on all dicarboxylic acid units, and a diamine unit containing a 1,9-nonane-diamine and/or 2-methyl-1,8-octanediamine unit in a proportion of about 60 mol% or more based on all diamine units and

a layer (c) comprising (C) a fluorine-containing polymer having introduced into the molecular chain thereof at least one functional group selected from the group consisting of a carboxy group, an acid anhydride group, a carboxylate group, an alkoxycarbonyl group, a hydroxyl group, a sulfo group, a sulfonate group, an epoxy group, a cyano group, a carbonate group and a carboxylic acid halide group, as said functional group having reactivity with the polyamide-based resin, and

wherein said layer (b) comprising (B) the semi-aromatic polyamide is disposed between said layer (a) comprising (A) polyamide 11 and/or polyamide 12 and said layer (c) comprising (C) a fluorine-containing polymer.

Therefore, the Applicants' multilayer tube (Claim 12) comprises a layer (a) comprising (A) polyamide 11 and/or polyamide 12; a layer (b) consisting of (B) a semi-aromatic polyamide or a combination of a semi-aromatic polyamide and an additive; and a layer (c) comprising a fluorine-containing polymer, and the layer (b) consists of (B) a semi-aromatic polyamide or a combination of a semi-aromatic polyamide and an additive.

The polymer of the layer (b) is a semi-aromatic polyamide. In sharp contrast, Nishi US discloses:

A hose for fuel having a laminated structure, comprising:
an inner layer made of an ethylene/tetrafluoroethylene copolymer and
an outer layer made of a polyamide resin, wherein the inner layer adheres to
the polyamide resin of the outer layer, and the outer layer is made of:
polyamide 12(a) that satisfies formula (1), or a mixture of polyamide 12(a)
that satisfies formula (1) and polyamide 12(b) that satisfies formula (2), ...
(Claim 1).

Claim 5 states that the outer layer is bonded to an outermost layer made of a polyamide resin.

Therefore, the outer layer made of polyamide 12(a) that satisfies formula (1), or a mixture of
polyamide 12(a) that satisfies formula (1) and polyamide 12(b) that satisfies formula (2), as set forth
in Claim 1, is the intermediate layer of the 3 layer tube stated in Claim 5, and corresponds to the
Applicants' layer (b)

Importantly, that outer layer is made of polyamide 12(a) or a mixture of polyamide 12(a) and
polyamide 12(b). That outer layer made of polyamide 12(a) or a mixture of polyamide 12 (a) and
polyamide 12(b) does not disclose, teach or suggest a layer (b) which consists of (B) a semi-aromatic
polyamide or a combination of a semi-aromatic polyamide and an additive.

The Applicants' polyamide (B) comprises a dicarboxylic acid unit containing a terephthalic
acid and/or naphthalenedicarboxylic acid unit in a proportion of about 50 mol% or more based on all
the dicarboxylic acid units, and a diamine unit containing a 1,9-nonanediamine and/or 2-methyl-1,8-
octanediamine unit in a proportion of about 60 mol% or more based on all the diamine units.

In polyamide (B), a terephthalic acid and/or naphthalenedicarboxylic acid unit is in a
proportion of about 50 mol% or more based on all the dicarboxylic acid units, and a diamine unit
containing a 1,9-nonanediamine and/or 2-methyl-1,8-octanediamine unit is in a proportion of about
60 mol% or more based on all the diamine units. Hence, the Applicants' semi-aromatic polyamide is
essentially different from polyamide 12(a) and polyamide 12(b) of Nishi US.

Nishi US teaches that the polyamide 12 (a) can be obtained by using 12-aminododecanoic
acid and/or dodecane lactam as the main components and incorporating a polyfunctional monomer
such as a diamine, a triamine, a dicarboxylic acid or a tricarboxylic acid thereto, - - - followed by
polymerization (col. 6, lines 36-43). Nishi US mentions 1,9-nonanediamine as an example of the
diamine to be incorporated, and terephthalic acid as an example of the dicarboxylic acid to be
incorporated (col. 6, lines 45 and 63).

The diamine and the dicarboxylic acid to be incorporated for polymerization only mean that the diamine and the dicarboxylic acid are examples of the polyfunctional monomer, namely minor ingredients, incorporated into the polyamide 12 to be formed by the main component of 12-aminododecanoic acid and/or dodecane lactam. Nishi US further mentions that the amount of such a polyfunctional monomer is preferably from 0.2 to 10 mass%, more preferably from 0.5 to 10 mass%, based on 12-aminododecanoic acid and/or dodecane lactam (col. 7, lines 4-7).

Thus, in Nishi US in polyamide 12(a), the 1,9-nonanediamine and the terephthalic acid mentioned are examples of the diamine and the dicarboxylic acid as the above-mentioned additional polyfunctional monomer that can be incorporated in the polyamide 12(a) in an amount of only 0.2 to 10 mass% based on the 12-aminododecanoic acid and/or dodecane lactam as the main components, not as components or monomers for polymerization to form polyamide 12 itself.

That polyamide 12(a) of Nishi US does not teach or suggest the Applicants' polyamide (B) comprising a dicarboxylic acid unit containing a terephthalic acid and/or naphthalenedicarboxylic acid unit in a proportion of about 50 mol% or more based on all dicarboxylic acid units, and a diamine unit containing a 1,9-nonanediamine and/or 2-methyl-1,8-octanediamine unit in a proportion of about 60 mol% or more based on all diamine units - - - namely PA9.

The rejection states that Nishi US teaches embodiments wherein the terephthalic acid and 1,9 nonanediamine units are present in 100% by mass of all diamine and dicarboxylic units (col. 5, line 55, to col. 7, line 17). However, Nishi US does not specifically teach or suggest a semi-aromatic polyamide in which the terephthalic acid and 1,9 nonane-diamine are used in 100% by mass of all diamines and dicarboxylic acids for polymerization of polyamide 12(a). Nishi US teaches the 1,9-nonanediamine and the terephthalic acid mentioned only as the examples of the diamine and the dicarboxylic acid of the additional polyfunctional monomer, as mentioned above.

In Nishi US, the polyamide 12(b) is similar to polyamide 12(a). Nishi US does not teach or suggest 1,9-nonanediamine and terephthalic acid as main component monomers to polymerize polyamide 12. In Nishi US, the outer layer is made of such polyamide 12(a) or a mixture of polyamide 12(a) and polyamide 12(b) (see Claim 1 and col. 6, lines 36-42)

Therefore, Nishi US discloses a layer (b) containing mainly PA12 and does not disclose, teach or suggest an outer layer that is the same as the mainly PA9 layer (b) of the Applicants. The Applicants therefore respectfully submit that the combination of Nishi JP with Nishi US would result

in a different structure from that recited in Claims 12-13, 17, 19, 21-23, 27-29, 31 and 33-35. Withdrawal of the rejection is respectfully requested.

Claims 36 and 37 stand rejected under 35 USC §103 over the further combination of Audenaert and Nishi JP with Nishi US. The Applicants respectfully submit, however, that Audenaert fails to provide additional disclosure teachings or suggestions that would cure the deficiency set forth above with respect to Nishi US. Withdrawal of that rejection is also respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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